Vishnu Kadiyala

Ph.D. Candidate (CS) | ML Systems & Infrastructure | Large-Scale Data Processing

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Summary

Ph.D. candidate working at the intersection of machine learning and scalable data systems. Experienced building end-to-end ML pipelines on HPC infrastructure, processing large real-world datasets (satellite, radar, camera streams), and iterating with a strong emphasis on benchmarking, reproducibility, and systems tradeoffs. Seeking Systems & AI/ML research internship roles focused on scalable compute, content processing, and ML workload performance.

Core Skills

Languages: Python, MATLAB (add: Go/Rust/C++ if applicable)
ML / AI: Transformers, CNNs, Diffusion Models, Anomaly Detection, Representation Learning
Systems: HPC/SLURM, experiment orchestration, data pipelines, reproducible training/eval
Data: Pandas, Xarray, NetCDF, large-scale preprocessing and feature generation
Engineering Strengths: Benchmark design, debugging, profiling mindset, clear technical writing

Systems & Infrastructure Experience

- Designed and operated ML workflows on HPC/SLURM, balancing queueing constraints, throughput, and experiment repeatability.
- Built data-processing pipelines for large spatio-temporal datasets with irregular sampling; optimized I/O patterns and preprocessing time.
- Implemented evaluation harnesses with reproducible configs, controlled ablations, and performance tracking across experiments.

Experience

Graduate Researcher — NSF AI2ES (ML Pipelines for Environmental Sensing) Jan 2024 – Present

- Built transformer-based learning systems for large, irregularly sampled environmental datasets; emphasized scalable preprocessing and consistent evaluation.
- Achieved **13× improvement** over a classical Marshall–Palmer rainfall baseline using a parameter-efficient neural approach (∼2.5M parameters).
- Developed vision-based visibility inference from distributed camera imagery, enabling broad coverage beyond sparsely deployed reference stations.
- Operated training and evaluation at scale on HPC/SLURM; documented assumptions, tradeoffs, and experiment methodology for reproducible results.

Graduate Researcher — NASA GeoCARB (Satellite ML & Content Processing) Jan 2021 – May 2023

- Developed U-Net model achieving **95% accuracy** for methane hotspot detection from satellite imagery; validated robustness across diverse scenes.
- Built time-series anomaly detection improving performance from **80% to 90.2%** using diffusion-based generative modeling.
- Implemented data processing and labeling workflows for geospatial datasets; focused on reliability under distribution shift and noisy observations.

Selected Projects (Prototypes & Evaluation)

- **Large-Scale Spatio-Temporal ML Pipeline:** preprocessing + training pipeline for irregular sensor data with reproducible configs and tracked benchmarks.
- **Document Content Understanding:** neural pipeline for table/plot localization with **99% detection accuracy**; dataset construction and automation tooling.
- **Evaluation Harness:** ablation-style experiment runner for consistent model comparisons and controlled reproducibility (configs, metrics, logs).

Publications (Selected)

- M. X. Sasser, M. Wilson Reyes, **V. P. Kadiyala**, et al. *Estimating Statewide Atmospheric Visibility From Camera Images.* AMS, 2025.
- E. Spicer, S. Crowell, F. Xu, **V. P. Kadiyala**, et al. *Pollutant Source Influence during TRACER.* AMS, 2024.
- **V. P. Kadiyala**. *Localization of Tables and Plots in Documents Using Deep Neural Networks.* M.S. Thesis, 2022.

Education

Ph.D., Computer Science (Expected 2027) — University of Oklahoma
M.S., Electrical & Computer Engineering — University of Oklahoma
B.E., Electronics & Communication Engineering — KLE Technological University